

REMARKS

Reconsideration and withdrawal of the examiner's rejections under 35 USC § 103 are respectfully requested in view of the amendments and the following remarks. The amendments made and the Rule 132 Declaration submitted herewith are to expedite the prosecution of this application to issuance without delay or, in the alternative, to narrow the issues for appeal.

Claim 6 has been canceled, without prejudice.

Claims 1, 11 and 14 have been amended to specify a viscosity, in accordance with a telephonic Interview with the Examiner, for which courtesy Applicants thank the Examiner. Support for this subject matter may be found in the Specification at page 11, lines 16-22.

Care has been taken not to introduce any new matter.

The Present Invention

The present invention is motivated by the need for low oil mayonnaise products that have flavor and mouthfeel characteristics that match full fat mayonnaise products. As set forth in Independent claims 1, 11 and 14, the present invention is directed to an edible oil-in-water emulsion or a multiple emulsion comprising an oil-in-water phase, a method for making the edible emulsion and a food product comprising the edible emulsion. The edible emulsion comprises, among other things, insoluble fibers and specifically limits the amount of carbohydrates (e.g. sugar, starch, gums) and limits oil. Insoluble fibers are used in the low oil compositions to replace some or all of the starch conventionally used in low oil emulsions such as mayonnaise, while achieving a

mouthfeel closely similar to that of full fat mayonnaise. Also, in the absence of starch or other carbohydrates, homogenization of a fiber containing emulsion achieves a mouthfeel and rheology closely similar to full fat mayonnaise.

The reduced oil food products made with the edible emulsion having insoluble fiber with a length from 25 to 400 microns and a width from 3 to 20 microns have consumer acceptable viscosities and texture and sensorial properties consistent with full fat food products. A critical sensorial property is that 2 ml of the emulsion will completely dissipate in a mouth of a consumer within 60 seconds. This is achieved in part by limiting the amount of carbohydrate within the edible emulsion and in part by use of insoluble fibers that are homogenized in the homogenizer according to the present invention. Such food products also have the benefit of being substantially free or completely free of carbohydrates; therefore, very desirable to high protein/low carbohydrate dieters. See Specification at page 2, lines 9-17. In particular, claim 25, which is dependent on claim 14, is directed to a carbohydrate free product.

The use of insoluble fibers according to the present invention processed in a HPH allows for total replacement of starch and gums on reduced oil products such as mayonnaise. The result is a low oil mayonnaise without starchy/sticky mouthfeel. This brings low oil mayonnaise in parity to full fat products. The invention is directed to a reduced oil (less than 75 % oil) product that unexpectedly has the mouthfeel of a full fat product, as discussed in the Specification at page 4, lines 15-17. The high pressure homogenizer used according to the present invention is used to activate the insoluble fibers to increase the viscosity of the product. The homogenizer is also used to create texture contrast from coarse to smooth, as well as to reduce oil droplet size. Coarse, as used herein means the insoluble fibers are detectable in the emulsion thereby producing discernible grainy or particle comprising characteristics when in the mouth.

Smooth, as used herein, means no discernible grainy or particle comprising characteristics when in the mouth.

A critical sensorial property, and an element of the independent claims, is that 2 ml of the emulsion will completely dissipate in a mouth of a consumer within 60 seconds. This is achieved in part by limiting the amount of carbohydrate within the edible emulsion and in part by use of insoluble fibers that are homogenized in the homogenizer according to the present invention.

The present invention as set forth in independent claim 1 is directed to an edible emulsion comprising:

- (a) less than about 75 % by weight oil;
- (b) water; and
- (c) about 0.5 to about 9.0% by weight insoluble **citrus** fibers; wherein the insoluble fibers have a length from 25 to 400 microns and a width from 3 to 20 microns;
- (d) about 0.1 to about 10.0% by weight emulsifier;

wherein the edible emulsion is coarse or smooth, comprises less than 1.0% by weight carbohydrate, and 2 ml of the emulsion will completely dissipate in a mouth of a consumer within 60 seconds; and

wherein the edible emulsion is an oil-in-water emulsion or a multiple emulsion comprising an oil-in-water phase and the emulsion has a viscosity of about 16,000 centipoise to about 80,000 centipoise. See Specification at p. 3, lines 8-13; p. 8, lines 3-6. Among other important claim elements, the cited references do not show how to achieve a low oil emulsion that has the viscosity and the mouth dissipation parameter of a full fat emulsion.

Independent claim 1 is further defined by the dependent claims which claim, among other things, the type of oil that may be employed, the HLB of the emulsifier and oil droplet size distribution.

Independent claim 11 is directed to a method for making the edible emulsion of claim 1 wherein oil, water, insoluble fiber and emulsifier are mixed to make a coarse emulsion; and the coarse emulsion is recovered and is homogenized in a homogenizer pressurized from about 35.0 to about 650.0 bar and at a temperature from about 15°C to about 70°C to produce a smooth emulsion. The edible emulsion that is made is an oil-in-water emulsion or a multiple emulsion comprising an oil-in-water phase, comprises less than 1% by weight carbohydrate and 2 ml of the emulsion will completely dissipate in the mouth of the consumer within 60 seconds. A further step of adding acidulant before or after the coarse emulsion is made.

The references relied on by the Office Action do not even remotely describe the claimed invention. The claimed invention is directed to a low oil edible emulsion, a method for making an edible emulsion and a food product comprising the low oil edible emulsion wherein the resulting emulsion that is used and the food product prepared therefrom can completely dissipate in a mouth of a consumer within 60 seconds. This is achieved in part by limiting the amount of carbohydrate within the edible emulsion and in part by use of insoluble fibers that are homogenized in the homogenizer according to the present invention. Applicants surprisingly developed a low oil edible composition with insoluble fiber that is not tacky and that dissipates well while maintaining an excellent viscosity. This unexpected dissipation characteristic is one which is typical of full fat products. Applicants have been able to achieve this effect even with formulations having reduced amounts of oil and carbohydrates, which prior art attempts have failed to achieve.

The present invention requires oil droplets dispersed in the water phase. In addition to droplet size and the amount of droplets dispersed, the close packing of the oil droplets results in the characteristic rheological behavior of the emulsions used to make the desired food product (e.g. mayonnaise). The insoluble fiber used in the present invention has a larger rod-like particles and a greater water-binding capacity.

Claims 1, 3, 8-11, 14, 16, 18 and 20-25 Are Not Obvious Over Hercules,
Either Alone or in View of Fischer and/or Lowe and/or Schwartzberg

Claims 1, 3, 8-11, 14, 16, 18 and 20-25 were rejected under 35 U.S.C. 103(a) as being unpatentable over Hercules alone or in view of Fischer and as further evidenced by Lowe and also Schwartzberg. According to the Office Action, Hercules discloses low fat salad dressing made to contain a pectin derivative as a fat substitute. The dressing formulation starting at line 37 bridging col. 6 and 7 is referenced. Fischer is cited to cure the failure of Hercules to disclose insoluble fibers. According to the Office Action, no unobvious or unexpected result is seen from oil droplet size. According to the Office Action, it is also appreciated that the settings for the homogenizer are not mentioned but to use one type of colloid mill over another would have been an obvious matter of choice with regard to the particular homogenizing apparatus that was available.

The subject matter of claims 1 and 11, and their dependent claims has been discussed above.

Applicants respectfully submit that Independent Claim 14, directed to a food product having an edible emulsion with the following characteristics, is separately patentable:

- (a) less than about 75 % by weight oil;
- (b) water; and

(c) about 0.5 to about 9.0% by weight insoluble fibers

wherein the edible emulsion is coarse or smooth, the insoluble fibers have a length from 25 to 400 microns and a width from 3 to 20 microns and 2 ml of the food product will completely dissipate in the mouth of a consumer within 60 seconds. The insoluble fibers have a length from 25 to 400 microns and a width from 3 to 20 microns. The edible emulsion is an oil-in-water emulsion or a multiple emulsion comprising an oil-in-water phase. The food product has a viscosity greater than about 35.0 centipoise and less than about 150,000 centipoise. See Specification at p. 8, lines 8-11. Independent claim 14 is further defined by the dependent claims which claim, among other things, the type of food product, the type of emulsifier and the amount of carbohydrates present.

Hercules teaches away from the low carbohydrate product of the present invention that has the required mouthfeel that is consistent with full fat. Hercules is merely directed to a 0 to low fat salad dressing composition with a continuous aqueous phase having a semi-gelled pourable system comprising an amidated galacturonic acid methylester with a degree of esterification below 55% to replace part or all of the fat in the salad dressing. As described in the examples of Hercules, high levels of sugar and starch are required (i.e. teaching away). Namely, Example 1 requires 2 % starch and gums; Example 2 requires 1 % starch and gums; Example 3 requires 1.1 % starch, 4 % sugar, and gums; see also Claim 16. Hercules is deficient and teaches away, and these vast deficiencies are not remedied by Fischer and/or Lowe and/or Shwartzberg since neither of those references is a low or no carbohydrate system.

While Hercules describe low calorie salad dressing, they do not appreciate the mouthfeel benefits of excluding carbohydrate and, therefore this is another reason why Hercules teach away from the present invention. The present claims specify less than about 1.0% carbohydrate. In particular, claim 25 is directed to a carbohydrate free

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product. A critical sensorial property, and an element of the independent claims, is that 2 ml of the emulsion will completely dissipate in a mouth of a consumer within 60 seconds. This is achieved in part by limiting the amount of carbohydrate within the edible emulsion and in part by use of insoluble fibers that are homogenized in the homogenizer according to the present invention. Hercules fails to disclose, suggest, or achieve this important property and Fischer, Lowe and Schwartzberg fail to cure this deficiency.

Fischer describes Herbacel AQ for applications where viscosity enhancement or thickening are acceptable as a side effect of dietary fiber fortification. While Fischer mentions ice cream and sorbet, there is not disclosure or suggestion to use Herbacel AQ in a low or no carbohydrate dressing. Accordingly, Fischer fails to cure the vast deficiencies and teachings away of Hercules.

It would not be predictable to one skilled in the art to (i) reduce/eliminate starch and (ii) use insoluble fiber to reduce oil with help of (iii) high pressure homogenization in order to achieve a reduced oil product such as low fat mayonnaise which matches full fat mayonnaise in mouthfeel.

Lowe and Schwartzenberg merely discuss some food emulsifiers and fail to cure the vast deficiencies of Hercules and Fischer as to how to achieve a mouth dissipation that behaves like full fat emulsion (e.g. mayonnaise) when the starch in a reduced oil mayonnaise is replaced with insoluble fibers (claims 1, 14 and dependent) or how to achieve a rheology comparable to that achieved with starch by replacement with insoluble fibers and use of high pressure homogenization of insoluble fibers (claim 11 and dependent).

Claim 11 and High Pressure Homogenization

Claim 11 requires high pressure homogenization and is separately patentable. Claim 15 differs from the cited art in the use of the high pressure homogenizer. In contrast, Hercules does not require high shear in order to obtain its desired texture. See Hercules at col. 4, lines 12-20.

The high pressure homogenizer used according to the present invention is used to activate the insoluble fibers to increase the viscosity of the product. The homogenizer is also used to create texture contrast from coarse to smooth, as well as to reduce oil droplet size. The use of insoluble fibers according to the present invention processed in a HPH allows for partial replacement of starch and gums on reduced oil products such as mayonnaise. The result is a low oil mayonnaise without sticky mouthfeel. This brings low oil mayonnaise in parity to full fat products. The invention is directed to a reduced oil product that unexpectedly has the mouthfeel of a full fat product.

Claim 18 Is Separately Patentable

Claim 18, directed to a mayonnaise having less than 75.)% oil and displaying mouth dissipation similar to mouth dissipation of full fat mayonnaise. The particular uniqueness and patentability of this claim is specifically supported by the Examples in the Specification, as further discussed below.

Claim 25 Is Separately Patentable

Applicants respectfully submit that dependent claim 25 is separately patentable and is in condition for allowance. In particular, claim 25 is directed to a carbohydrate free product. Free of carbohydrates means no carbohydrates are present within the

food product. See arguments above with respect to the independent claim 14 from which this claim depends, as well as discussion below as to evidence presented. It would be unexpected to one skilled in the art, at the time the invention was made, that in the absence of starch and other carbohydrates, a low fat emulsion (e.g. mayonnaise) achieves the same mouthfeel as that of full fat mayonnaise.

Evidence of Unexpected Results Must Be Considered

While Applicants do not believe that a *prima facie* case of obviousness has been made out in the Office Action, they will nevertheless point out evidence of unexpected results presented in the Specification. The in-mouth breakdown profile of mayonnaise compositions was assessed by an expert taster. The results in Example 3 on pp. 15-16 of the Specification demonstrate that low oil mayonnaise compositions made according to this invention, unexpectedly, had an initial mouthfeel similar to that of conventional full fat (high oil, e.g. 77 %) mayonnaise compositions and superior to that of conventional low oil mayonnaise compositions (i.e. 30 %). The results also demonstrate that the mayonnaise compositions made according to the present invention, unexpectedly, were not tacky and dissipated in the mouth in a manner similar to that of conventional high oil mayonnaise compositions. See, particularly, Table 1 at page 15.

Additionally, Applicants are submitting a Rule 132 Declaration in support of the claims as amended.

In view of this, it is respectfully requested that the rejections be withdrawn and rendered moot.

As the independent claims are novel and non-obvious, so are the claims dependent thereon.

CONCLUSION

In light of the above amendments and remarks, applicants submit that all claims now pending in the present application are in condition for allowance. Reconsideration and allowance of the application is respectfully requested.

If a telephone conversation would be of assistance, Applicant's undersigned attorney invites the Examiner to telephone at the number provided.

Respectfully submitted,

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